

CLAIMS:

1. A process for preparing a crystalline silicoaluminophosphate molecular sieve, which process comprises; forming a reaction mixture comprising a source of alumina, a source of phosphate, a source of silica and at least one organic template which comprises one or more tertiary dialkylbutylamines, wherein the alkyl groups are not butyl, inducing crystallization of crystalline molecular sieve, and recovering the crystalline molecular sieve.
2. A process as claimed in claim 1, further comprising the step of calcining the crystalline molecular sieve.
3. A process as claimed in claim 1, wherein the one or more tertiary dialkylbutylamines have the general formula (I):
$$(R)(R')N-(C_4H_9) \quad (I)$$
wherein R and R', which may be the same or different groups, are substituted or un-substituted aliphatic or cycloaliphatic groups, except butyl groups.
4. A process as claimed in claim 3, wherein R and R' are linear alkyl groups, but not butyl groups.
5. A process as claimed in claim 3, wherein R and R' are cycloaliphatic groups.
6. A process as claimed in claim 3, wherein R and R' are linear or branched alcohol groups, or linear or branched amine-containing groups.
7. A process as claimed in claim 3, wherein R and R' contain an alkyl group having from 1 to 3 or 5 to 12 carbon atoms.

8. A process as claimed in claim 3, wherein R and R' contain an alkyl group having from 1 to 3 or 5 or 6 carbon atoms.
9. A process as claimed in claim 3, wherein R and R' contain an alkyl group having from 1 to 3 or 5 carbon atoms.
10. A process as claimed in claim 3, wherein R and R' contain an alkyl group having from 1 to 3 carbon atoms.
11. A process as claimed in claim 3, wherein R and R' are independently one of the following alkyl moieties: methyl, ethyl, n-propyl, iso-propyl, n-pentyl, iso-pentyl, n-hexyl, iso-hexyl, heptyl, iso-heptyl, n-octyl, iso-octyl, n-decyl, iso-decyl, n-undecyl, iso-undecyl, n-dodecyl and iso-dodecyl.
12. A process as claimed in claim 11, wherein R and R' are independently methyl, ethyl and propyl, most preferably methyl.
13. A process as claimed in claim 3, wherein the $-C_4H_9$ group in formula (I) is n-butyl.
14. A process according to claim 1, wherein the process is for the manufacture of a silicoaluminophosphate molecular sieve of framework type AEL.
15. The process of claim 14, wherein the molar ratio of organic template to Al_2O_3 in the synthesis mixture is less than 3.
16. A process according to claim 1, wherein the process is for the manufacture of a silicoaluminophosphate molecular sieve of framework type CHA.

17. The process of claim 16, wherein the molar ratio of organic template to Al_2O_3 in the synthesis mixture is 2 or greater.
18. The process of claim 16, wherein the molar ratio of organic template to Al_2O_3 in the synthesis mixture is 3 or greater.
19. A process according to claim 1, wherein the process is for the manufacture of a silicoaluminophosphate molecular sieve of framework type CHA or AEL and wherein the molar ratio of $\text{P}_2\text{O}_5/\text{Al}_2\text{O}_3$ ratio in the synthesis mixture is within the range 0.8 to 1.3.
20. A silicoaluminophosphate molecular sieve, substantially of CHA framework type, comprising within its intra-crystalline structure at least one template which contains one or more tertiary dialkylbutylamines, wherein the alkyl groups are not butyl.
21. The silicoaluminophosphate molecular sieve of claim 20, wherein the one or more tertiary dialkylbutylamines is N,N-dimethylbutylamine.
22. The silicoaluminophosphate molecular sieve of claim 21, wherein the molecular sieve is SAPO-34.
23. A silicoaluminophosphate molecular sieve, substantially of AEL framework type, comprising within its intra-crystalline structure at least one template which contains one or more tertiary dialkylbutylamines, wherein the alkyl groups are not butyl.
24. The silicoaluminophosphate molecular sieve of claim 23, wherein the one or more tertiary dialkylbutylamines is N,N-dimethylbutylamine.

25. The silicoaluminophosphate molecular sieve of claim 24, wherein the molecular sieve is SAPO-11.
26. The silicoaluminophosphate molecular sieve of claim 23, having a platelet morphology.
27. A method for the manufacture of a formulated catalyst composition, which method comprises forming a mixture comprising at least one silicoaluminophosphate molecular sieve according to claim 20 with at least one formulating agent, to form a catalyst composition.
28. A method for the manufacture of a formulated catalyst composition, which method comprises forming a mixture comprising at least one silicoaluminophosphate molecular sieve according to claim 23 with at least one formulating agent, to form a catalyst composition.
29. A formulated molecular sieve composition comprising at least one silicoaluminophosphate molecular sieve according to claim 20 in admixture with at least one formulating agent.
30. A formulated molecular sieve composition comprising at least one silicoaluminophosphate molecular sieve according to claim 23 in admixture with at least one formulating agent.